

Protocol 4 · Diabetic foot wounds after surgery, and chronic diabetic foot ulcers

Evidence position: **Moderate** · Source: NPWT Evidence Library, www.wondsortg.co.za/NPWT.html, content as at 2026-10-04

Indication

Diabetic foot wounds after surgery, and chronic diabetic foot ulcers.

What this means

A diabetic foot wound is an ulcer or a surgical wound (after debridement or a partial foot amputation) in a patient with diabetes. Nerve damage removes the warning of pain, high glucose impairs healing, and narrowed arteries may starve the foot of blood. NPWT is used to build healthy granulation tissue and prepare the wound for closure or a skin graft. It is one of the best-supported NPWT indications, provided the foot has enough blood supply.

Why NPWT is used here

In the Lancet trial after partial foot amputation, 56 percent healed with NPWT versus 39 percent with standard care. In a 342-patient trial, closure was 43 versus 29 percent with fewer second amputations. Cochrane puts the amputation risk ratio at 0.33 (low certainty). International guidelines suggest NPWT for ulcers that have not progressed after four to eight weeks of good standard care, once ischaemia is excluded.

Patient selection

- A post-debridement or post-amputation wound (University of Texas grade A2 or A3), or a chronic ulcer not progressing after four weeks of standard care.
- Perfusion documented against the thresholds in protocol 6. ABPI is unreliable in diabetes because of calcified arteries: obtain a toe pressure or TcPO₂ and say why.
- Infection controlled and off-loading in place first. The guideline grades that prerequisite (1B) higher than NPWT itself (2B).
- Larger ulcers benefit more: in one trial the advantage appeared only above about 5 square centimetres.

For all NPWT

- The patient must be compliant and compos mentis: able to understand what the device does, keep the seal, protect the tubing and pump, report bleeding, pain or alarms, and attend or receive dressing changes.
- The patient's circle of care must be included: family, carers, home-nursing service or ward team, whoever will be present when the seal fails at night. Document who was told what and who is responsible for the device between visits.

Contraindications

Specific to this indication

- Untreated ischaemia: a red contraindication. Critical limb ischaemia (no pulses, TcPO₂ below 30 mmHg) must be revascularised first.
- Untreated osteomyelitis or undrained deep infection.
- Dry gangrene: leave it dry; do not apply suction.

For all NPWT: do not apply if

- Active bleeding beyond capillary ooze. Stop it first; NPWT does not control bleeding.
- An uncorrected clotting disorder.
- An exposed vessel, graft, anastomosis, organ or nerve with no barrier between it and the foam.
- Dead tissue not yet debrided, untreated bone infection, or cancer in the wound bed.

Proceed with caution and record the decision

- Blood thinners: a caution, not a bar. Lowest effective pressure, barrier over any vessel, inspect at every change, record the decision.
- Pacemaker or defibrillator: the pump of the canister-free single-use device (PICO) holds a magnet. Keep it 10 to 15 cm from the device, away from the chest, and record where it sits.
- Fragile surrounding skin or adhesive allergy. Children: no NPWT system was cleared for them as at 2011; treat as a hard limit unless current labelling says otherwise.

Potential risks and side-effects

- Deepening ischaemia if suction is too high over a poorly perfused foot: tissue pressure under the dressing rises with the vacuum.
- Realistic expectations: in advanced ulcers only about one in five closed completely with NPWT alone; most went on to a graft or secondary closure. NPWT prepares the bed more reliably than it closes the wound.
- Disclose the largest trial: in 686 open surgical wounds, 80 percent in diabetic patients, NPWT did not speed healing (high certainty) and was not cost-effective in the UK. Ask for a bounded bed-preparation period with a stated endpoint, not for faster healing.
- Bleeding: the serious harm. All six deaths in the regulator's first two-year series, and nine of twelve overall, were bleeds in patients whose bleeding risk had been missed (12 deaths, 174 injuries).
- Skin blistering: about 3.5 times more likely than with an ordinary dressing (risk ratio 3.55, 95% CI 1.43 to 8.77).
- Pain at changes (pre-medicate; soak a stuck sponge with saline) and anxiety in the first days, which settles. Say so beforehand.
- Retained foam, the regulator's commonest injury: count every piece in and out, and never cut foam over the wound. Adhesive damage to skin.

Treatment protocol

Pressure	Minus 80 to minus 125 mmHg continuous for a well-perfused foot. Minus 50 to minus 80 mmHg where perfusion is borderline (see protocol 6).
Mode	Continuous for the first 48 hours; intermittent may be used once the bed is stable and not bleeding.
Interface	Black polyurethane foam. Silver foam if bacterial load is a concern. PVA foam over exposed tendon.
Change interval	Every 48 to 72 hours; every 24 to 48 hours if infected.
Duration and review	Reassess at every change. Stop and re-plan if no progress at four weeks. State the endpoint: closure, graft or flap.

Step by step

1. Before starting: document glucose control, perfusion grade, infection status and off-loading. If any is not addressed, address it first.
2. Debride to a clean bed. Confirm no active bleeding.
3. Cut foam to the wound shape, protecting any exposed tendon or bone with PVA foam. Count and record pieces.
4. Seal carefully around the toes and contours; a leaking seal on a foot is common and defeats the therapy.
5. Set the pressure for the perfusion grade. Confirm draw-down.
6. At each change measure the wound and photograph it. Progress in wound-bed preparation, not just size, is the aim. Plan the graft when the bed is ready.

When to stop and call for help

- Fresh bleeding into the canister or dressing: pump off, pressure on, call the surgeon.
- New or rising pain, spreading redness, fever or a foul smell: review the same day.
- A seal that cannot be held for more than two hours.
- No progress at four weeks: stop and re-plan.

Outcome measures

- Wound area and depth at each change, and the percentage reduction at four weeks.
- Time to a graftable bed and time to complete closure.
- Whether any amputation, or a higher amputation, was needed.
- Infection events and antibiotic days.
- Days of therapy and length of stay.

What to document at every change

- Indication; which contraindications were checked and excluded.
- Pressure, mode, interface, and the number of foam pieces placed and removed.
- Wound length, width and depth, a dated photograph, exudate, any bleeding, and the pain score.
- The planned review date and the endpoint (closure, graft or flap).

A point worth knowing

Germany's statutory assessment body reviewed 21 randomised trials to 2010 and concluded that superiority over conventional treatment was not proven, because most trials were small and at high risk of bias. Later trials and reviews are more positive, but the fair summary is that NPWT reliably prepares the wound bed for a planned surgical endpoint, and that is how it should be requested and measured.

Funding note (South Africa)

ICD-10: E11.5 / E10.5 / E14.5 (lead); pair with L97 or the gangrene code. **PMB:** 915E where gangrene is coded; diabetes-with-complications pathway.

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